From:	Elizabeth Goldmann
To:	Goldmann, Elizabeth
Subject:	Fw: timing for (a)(2)?
Date:	Wednesday, October 26, 2016 9:20:05 AM
Attachments:	SCR Border H Holub 2001.mht Summary of Water Quality Standards for the Interstate Waters of AZ.pdf AZ WQS 1967.pdf

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Fw: timing for (a)(2)?		12/16/2008 12:36 PM	
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Body

Document Body

(I started this last week and ran out of time. here are my thoughts. I understand there has been a call recently and you are probably more up to speed than I am right now.)

Hi Tod,

I'm relieved Sam Brown spoke to you.

My understanding is that [redacted]

A few of my initial reactions to the paper and the theory.

1. (b)(5) deliberative & attorney client privileged [redacted]

[redacted]

[redacted]

[redacted]

[redacted]

Thanks for looking at this. Let me know if there is anything you need from me on this.

Danita Yocom
U.S. EPA
75 Hawthorne Street, RC-3
San Francisco, California 94105
NEW Telephone No.: (415) 972-3885
NEW Fax No.: (415) 947-3570

Thanks Danita. b5 deliberative [redacted] Thanks.

----- Forwarded by Danita Yocom/R9/USEPA/US on 12/12/2008 02:50 PM -----

Jessica Kao/R9/USEPA/US

12/12/2008 01:45 PM

To Danita Yocom/R9/USEPA/US@EPA

cc

Subject Fw: Re: timing for (a)(2)?

FYI and more than you want to know. My original email raised the need to consult Indian law attorneys on using the TAS argument.
-----Forwarded by Jessica Kao/R9/USEPA/US on 12/12/2008 01:41PM -----

To: Karyn Wendelowski/DC/USEPA/US@EPA
From: Jessica Kao/R9/USEPA/US
Date: 12/12/2008 06:26AM
cc: Hugh Barroll/R9/USEPA/US@EPA, Kevin Minoli/DC/USEPA/US@EPA, Samuel Brown/DC/USEPA/US@EPA, Donna Downing/DC/USEPA/US@EPA, DavidW Smith/R9/USEPA/US@EPA, Amy Miller/R9/USEPA/US@EPA
Subject: Re: timing for (a)(2)?

> Here is some of the info. in response to your email and call yesterday. I'm including Amy Miller on the email b/c she's very familiar with the documents and data we collected, having spent three years on the Johnson case, and can help point to usable sources.
>
> 1. Water Quality standards adopted under 1965 Water Quality Act :

The Arizona state legislature (ARS 36-1853) created the Water Quality Control Council in 1967 to meet the requirements of the Water Quality Act of 1965. (See http://www.lib.az.us/archives/record_rg_147_evironmental_quality_sg_1.cfm .) The Council adopted standards for waters that were considered interstate waters under WQA, including the SCR. The relevant documents I have found so far are attached and described below. Additional documents may be forthcoming from the AZ State Library Archives and other sources, but these are directly on-point and may be sufficient for our purposes.

a. **Water quality standards for streams in Arizona.**
Author Arizona. Water Quality Control Council. Year Published 1967
Page 1 (of section 2) states that the Santa Cruz River is an interstate stream for WQA purposes.

b. **SUMMARY OF WATER QUALITY STANDARDS FOR INTERSTATE WATERS OF ARIZONA; AZ DEPT OF HEALTH** . Page 2 states that "Arizona adopted standards for its interstate waters on June 20, 1967, which were then submitted to the Department of the Interior. Subsequently, certain revisions were made by the State in the original standards, and the Secretary of the Interior approved the standards, as revised, on September 27, 1968." This document has no date, but seems to have been published shortly after September 27, 1968. Standards were set for the SCR, which is listed as one of the interstate waters for purposes of the WQA.

Question: AZ's "interstate waters" list covered only the bigger rivers and lakes; it omits smaller x-border waters that on their face meet the "interstate waters" definition. The Nogales Wash, one of the major tributaries of the upper SCR and a frequent topic of discussion between US and Mexico, comes to mind. There are also many small washes and drainages that cross the AZ/Mexico borders or state borders. Are we contemplating using the interstate water lists used by states and approved by fed for purposes of setting standards under WQA as a take-off point or as a limiting factor? In other words, how far can one go with the (a)(2) argument? What may be the limits on covered waters, if any?

2. Historical narrative (longstanding hydrographic features, flows etc) :

a. The most comprehensive, and reliable, account of the River is a book titled The Lessening Stream: An Environmental History of the Santa Cruz River , by Michael Logan (U of A, 2002). It traces the river's central role in that region from Precambrian time through thousands of years of farming/irrigation traditions by the Native Americans to the present. The river morphology and paths have changed many times over, especially the lower reach in recent times (see 5 below). However, the headwater through the interstate portion of the River (the portion that flows from the Patagonia Mountains into Mexico then loops back into Arizona near Nogales) has been relatively stable for some time. If you'd like to take a look at the book but can't get hold of it, I can have my copy of the book, which is in my office, Fed-Exed Friday, on condition that it be returned when done.

b. The long SCR navigability report submitted by the AZ State Land Department also contained some useful sections, with sourced references, on the River's historical significance and hydrographic features. I have a pdf version of the report in a database, which I will get someone to find it and send over.

3. International agreements, etc :

a. The present-day International Boundary and Water Commission (IBWC), US Section, was set up per the 1944 Water Treaty between US and Mexico to address bi-national boundary, water usage and water quality issues, including those involving the SCR. For a general discussion of treaties and agreements that may affect the SCR, see http://www.ibwc.state.gov/ and the attached article by H. Holub, Esq. (We had various disagreements on permitting, enforcement and grants issues relating to the Nogales International Wastewater Treatment Plant/NIWTP in the past but the main points of the article seem right; the article was also the source of the COE's SCR TNW writeup quoted in your email.)

b. In terms of agreements specific to the SCR, AZ and Sonora Mexico share surface and ground water resources supplied by the SCR. Because of contribution of raw sewage from Mexico, allocation of treated NIWTP effluent between the two nations, NAFTA, and many associated environmental and health concerns, there have been various bi-national agreements, understandings, workgroups and project to address these issues. A major focal point is the NIWTP, which is located on the AZ side and discharges directly to the SCR about 10 miles from the border. It treats about 10 mgd of sewage from Nogales, Sonora, Mexico and 5 mgd from Nogales, Arizona. The NPDES permit is jointly held by IBWC and the City of Nogales, and the construction costs were shared bi-nationally. For basic information , see

http://www.ibwc.state.gov/Files/nogales.pdf

4. Flow data, etc:

a. Upper SCR (headwater to approximately Tucson/Marana/end of COE TNW determination): In addition to sources mentioned in 2, there are USGS gages for the upper SCR, including immediately upstream and downstream from the Mexican portion dating back quite far. I don't believe there's a gage for the flow through the San Xavier District portion of The Tohono O'odham Nation (TO), as the SCR in that stretch is mainly subsurface.

b. Lower SCR (From Marana on): Precise x-boundary flow info. is lacking b/c the long stretches through TO, the Ak-Chin Indian Community and portions of Gila River Indian Community (GRIC) are and have been mostly non-perennial and therefore very poorly gaged. From field experience, etc, the effluent flow from the state side could reach TO. There is a gage near the Santa Cruz/Gila confluence, on GRIC.

5. Lower Santa Cruz River/Tribal connections

I should point out a potential layer of complication for applying the tribal theory in this particular case. The lower SCR used to flow in channels about 30 miles northeast of its current position, through an area called the Santa Cruz flats towards the Gila River. As far as I could tell, this old path does not involve any tribal land, except near the confluence with the Gila, where GRIC lies. Around 1915, the Greene's Canal was constructed to divert the flow from the SCR to the Green Wash. As a result, the old channels through the Flats became mostly discontinuous and may only send convey flows during extraordinary storm events. The Green Wash, which runs more or less parallel to the old SCR channels, flows through TO. It connects to the Santa Rosa Wash, a (very small? Amy do you know) portion of which flows through Ak-Chin. The Santa Rosa Wash then connects to the Santa Cruz Wash, a portion of which flows through GRIC to the Santa Cruz and the Gila. In other words, hydrologically speaking, the lower SCR subsumes segments of those washes. (Also, by broadly invoking the tribal theory for (a)(2), these washes, along with a substantial number of other x-boundary washes, are interstate waters in their own right.) There have been fairly constant arguments/confusion about what's the Santa Cruz River, as many articles, books and maps only show or recognize the lower SCR in its old, not current flow paths.

-----Karyn Wendelowski/DC/USEPA/US wrote: -----

To: Jessica Kao/R9/USEPA/US@EPA
From: Karyn Wendelowski/DC/USEPA/US
Date: 12/09/2008 12:19PM
cc: Hugh Barroll/R9/USEPA/US@EPA, Kevin Minoli/DC/USEPA/US@EPA, Samuel Brown/DC/USEPA/US@EPA
Subject: Re: timing for (a)(2)?

Jessica - b5 deliberative
[redacted]

b5 deliberative

[redacted]

[redacted]

[redacted] b5 deliberative

Thank you! And let me know if you think it would be a good idea for us to set up some time to talk.
Karyn
Jessica Kao/R9/USEPA/US

Jessica Kao/R9/USEPA/US	To	Karyn Wendelowski/DC/USEPA/US@EPA, Kevin Minoli/DC/USEPA/US@EPA
	cc	Hugh Barroll/R9/USEPA/US@EPA
12/09/2008 02:54 PM	Subject	timing for (a)(2)?

Hi, Kevin and Karyn,

b5 deliberative

[redacted]

(See attached file: AZ WQS 1967.pdf)(See attached file: Summary of Water Quality Standards for the Interstate Waters of AZ.pdf)(See attached file: SCR Border H Holub 2001.mht)

PREFACE

The information contained herein has been condensed from Water Quality Standards for Surface Waters in Arizona, prepared by the Arizona State Department of Health, and approved by the Secretary of the Interior. This summary is intended for all who have an interest in the quality of water in the State.

A summarization of this type, of necessity, omits many pertinent details. The complete text or the Arizona State Department of Health should be referred to for more detailed information.

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Summary of Water Quality Standards

for

The Interstate Waters of Arizona

Introduction

In the Water Quality Act of 1965, Congress authorized the establishment of water quality standards for interstate (including coastal) waters. The purpose of these standards is to protect and enhance the quality and productivity of the Nation's interstate waters to serve a variety of beneficial uses, such as public water supply, recreation and protection of aquatic life, and industrial and agricultural uses. This publication summarizes the standards for the general information of the American public and Federal, State and local officials as to the uses and associated requirements for interstate waterways.

The Act, which amended the Federal Water Pollution Control Act, provided for the States to have the first opportunity to establish standards for their interstate waters, which were then subject to review and approval by the Secretary of the Interior. All of the States, the District of Columbia and the Territories of Guam, Puerto Rico and the Virgin Islands participated in this landmark effort to set

Arizona adopted standards for its interstate waters on June 20, 1967, which were then submitted to the Department of the Interior. Subsequently, certain revisions were made by the State in the original standards, and the Secretary of the Interior approved the standards, as revised, on September 27, 1968.

The approved standards are thus both State and Federal standards, enforceable under the State water pollution control statutes and the Federal Water Pollution Control Act, as amended (Section 10). The waters for which standards were adopted are shown on the map in Figure 1.

The standards consist of three major components: designation of the uses which interstate waters are to serve, specification of narrative and numerical criteria to protect and enhance water quality, and specification of a plan of implementation and enforcement, which includes treatment and control requirements for municipal, industrial and other wastes discharged to or affecting interstate waters. These components are discussed in the following sections; all three are essential to a complete standards program.

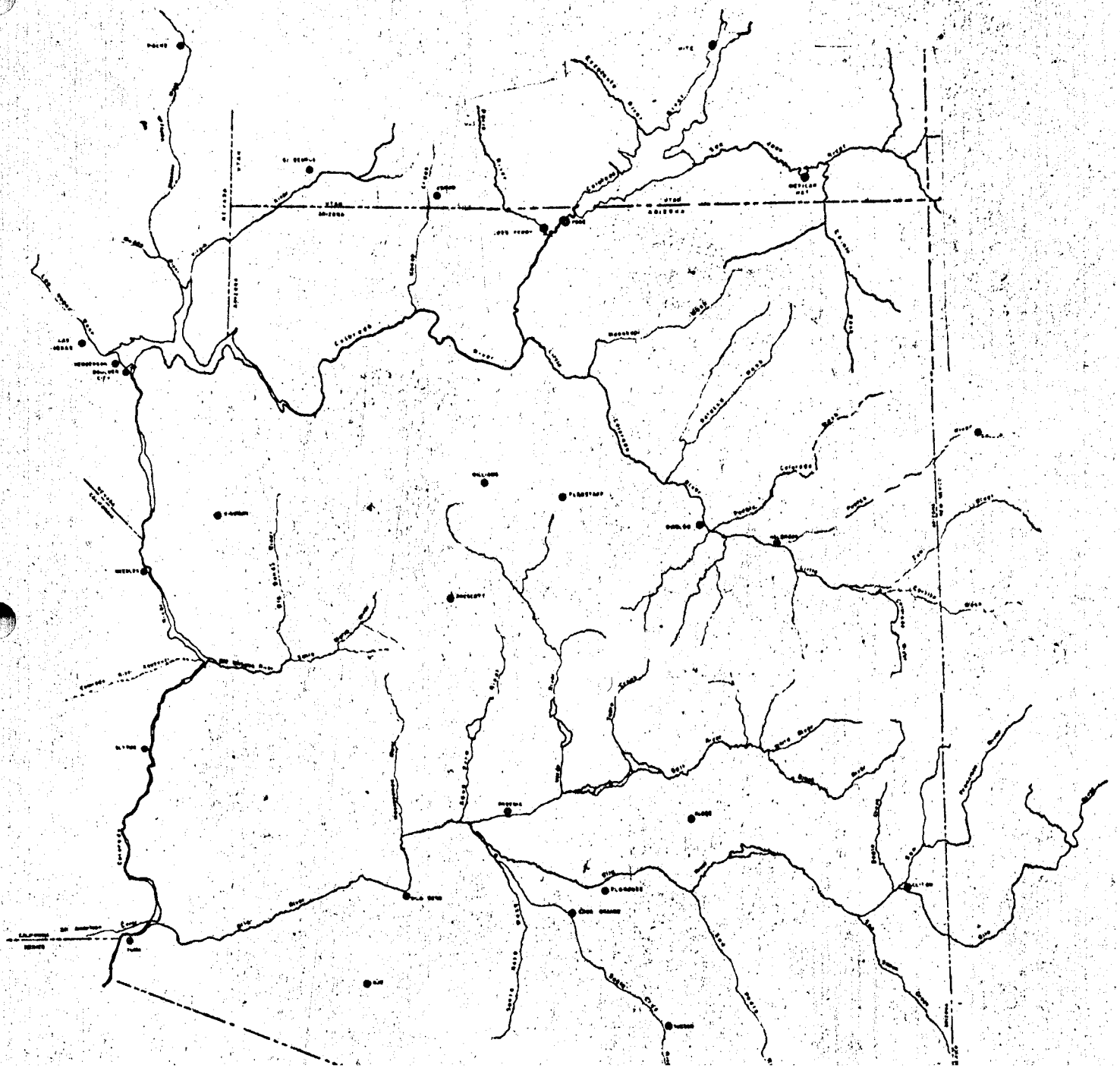
with implementing the standards is gained, the standards will be refined and improved to reflect this new knowledge.

Should more detailed information be required on any aspect of the standards, it may be obtained from the Arizona State Department of Health or the Federal Water Pollution Control Administration Regional Office in San Francisco, California. Arizona has also established water quality standards for its intrastate waters, and information on these standards may also be obtained from the Arizona State Department of Health. The addresses of these offices are given on page 24. Other agencies of the State of Arizona which have authority for water pollution control activities are:

Arizona Game and Fish Department Authorized to bring suit against persons discharging substances deleterious to fish and wildlife.

Oil and Gas Conservation Commission Authorized to adopt rules to prevent the pollution of fresh water supplies by oil, gas, or salt water as a result of drilling, casing, or plugging of wells.

State of Arizona



Water Uses

The State of Arizona designates the following uses to be protected in various interstate waters:

Agricultural

Domestic Water Sources

Industrial

Propagation of Aquatic and Wildlife Resources

Recreation

Esthetics

The general aim in designating uses for particular interstate waters is to recognize present uses and practicable future uses, to provide where possible for a variety of uses, and to assure compatibility of standards with Federal, State and local resource planning. In order to satisfy the intent of the Federal Water Pollution Control Act to enhance water quality, the standards specifically provide that no interstate waters may be used solely or primarily for waste assimilation. All interstate waters must be esthetically pleasing, and this quality is usually protected by narrative criteria preventing unsightly or obnoxious conditions, such as floating debris, oil slicks, unpleasant odors, and colors.

INTERSTATE WATERS	WATER USES							
				Aquatic & Wildlife		Recreation		
	Agricultural	Domestic water supply	Industrial supply	Coldwater fishery	Warm water fishery	Primary contact	Secondary contact	Esthetic use
RIVER MAIN STEM & TRIBUTARIES								
Colorado River								
Utah Border to Lake Mead	X	X	X	X		X		X
Lake Mead	X	X	X		X	X		X
Lake Mead to Topock	X	X	X	X		X		X
Topock to Imperial Dam	X	X	X		X	X		X
Imperial Dam to Laguna Dam	X	X	X			X		X
Laguna Dam to Yuma	X	X	X		X	X		X
Yuma to Mexico border	X		X		X		X	X
Paria River	X		X		X		X	X
Kanab Creek	X		X		X		X	X
Virgin River	X		X		X		X	X
BASIN								
Chinle Wash	X		X		X		X	X

INTERSTATE WATERS	WATER USES							
				Aquatic & Wildlife		Recreation		
	Agricultural	Domestic water supply	Industrial supply	Coldwater fishery	Warm water fishery	Primary contact	Secondary contact	Esthetic use
LORADO RIVER BASIN								
Little Colorado River								
Headwaters of Little Colo. River	X		X	X			X	X
All but headwaters	X		X		X		X	X
R BASIN								
Gila River								
New Mexico border to Hayden-Ashurst Dam	X		X		X		X	X
San Francisco River	X		X		X		X	X
San Pedro River	X		X		X		X	X
Santa Cruz River	X		X		X		X	X

INTERSTATE WATERS	Agricultural	Domestic water supply	Industrial supply	Aquatic & Wildlife: Coldwater fishery	Aquatic & Wildlife: Warm water fishery	Recreation: Primary contact	Recreation: Secondary contact	Esthetic use
NS ALONG MEXICO BORDER								
All Rivers	X		X		X		X	X
OUNDMENTS								
All impoundments	X		X		X	X		X

Water Quality Criteria

The protection of water quality and uses requires the establishment of numerical and narrative limits on pollutants which damage these uses. The water quality criteria in this section reflect the best scientific judgment available as to the water quality requirements for the assigned uses. Numerical criteria are used wherever it is reasonable to do so. However, narrative criteria are also necessary in some cases, particularly with respect to esthetic considerations.

Some interstate waters have a higher quality than the minimum levels assigned for protection of water uses, and the standards seek to protect this higher quality as much as possible in the face of increasing social and economic development. Scientific knowledge about the exact water quality requirements for uses is limited, and by preventing degradation of high quality waters, the standards seek to assure optimum, not marginal, conditions to protect the uses associated with clean waters.

The following sections and Table 2 show the water quality criteria for each use protected by the Arizona standards. In addition, the standards contain general narrative criteria, including a statement on controlling degradation of high quality waters.

will not be lowered in quality unless and until it has been affirmatively demonstrated to the State Water Quality Control Council that such change is justifiable as a result of necessary economic or social development and will not interfere with or become injurious to any assigned uses made of, or presently possible in, such waters. Any industrial, public or private project or development which could constitute a new source of pollution or an increased source of pollution of high quality waters will be required, as part of the initial project design, to provide the highest and best degree of waste treatment practicable under existing technology. In implementing the policy of this paragraph as it relates to interstate streams, the Secretary of the Interior will be kept advised and provided with such information as he will need from time to time to protect the interests of the United States and the authority of the Secretary in maintaining high quality of interstate waters.

Basic Criteria:

All waters shall be:

1. Free from substances attributable to domestic or industrial waste or other controllable sources that will settle to form sludge

2. Free from floating debris, oil, grease, scum, and other floating materials attributable to domestic or industrial waste or other controllable sources in amounts sufficient to be unsightly or in amounts sufficient to interfere with any beneficial use of the water.

3. Free from materials attributable to domestic or industrial waste or other controllable sources in amounts sufficient to produce taste or odor in the water or detectable off-flavor in the flesh of fish, or in amounts sufficient to change the existing color, turbidity or other conditions in the receiving stream to such degree as to create a public nuisance, or in amounts sufficient to interfere with any beneficial use of the water.

4. Free from toxic, corrosive, or other deleterious substances attributable to domestic or industrial waste or other controllable sources at levels or combinations sufficient to be toxic to human, animal, plant or aquatic life or in amounts sufficient to interfere with any beneficial use of the water.

Specific Criteria:

For waters having the following uses:

A. Domestic & Industrial Supply

the samples during any 30-day period exceed 2000/100 ml; as determined by either multiple-tube fermentation or membrane filter techniques.

2. pH - The pH shall remain within the limits of 6.5 and 8.6 at all times. The maximum change permitted as a result of waste discharges shall not exceed 0.5 pH units.

3. Temperature - Heat added to any water shall be the lowest practical value. In no case shall heat be added in excess of that amount that would raise the temperature of the minimum daily flow of record for that month more than 5° F above the monthly average of the maximum daily water temperature prevailing in the water or stream section under consideration; nor shall heat be added in excess of that amount that would raise the stream temperature above 93° F. This provision shall not apply to lakes or impoundments owned by a firm or individual for the express purpose of providing and/or receiving heat wastes.

4. Turbidity - Turbidity of the water will be maintained at the lowest practicable values possible, but in no case shall:

a. Turbidity in the receiving waters due to the discharge

A violation of the above numerical turbidity standards resulting from construction, mining, logging, and related land uses shall be grounds for abatement in accordance with ARS 36-1851 to 1868 inclusive.

5. Biocides - Biocide concentrations shall be kept below levels which are deleterious to human, animal, plant or aquatic life, or in amounts sufficient to interfere with this beneficial use of the water.

6. Radioactivity - The concentration of radioactivity in the surface waters of the State shall not:

a. Exceed 1/30th of the MPC_w values given for continuous occupational exposure in National Bureau of Standards Handbook No. 69.

b. Exceed the Public Health Service Drinking Water Standards for waters used for domestic supplies.

c. Result in the accumulation of radioactivity in edible plants or animals that present a hazard to consumers.

d. Be harmful to aquatic life.

Since any human exposure to ionizing radiation is undesirable,

primary contact recreation waters shall not exceed a geometric mean of 200/100 ml, nor shall more than 10% of the total samples during any 30-day period exceed 400/100 ml, as determined by multiple-tube fermentation or membrane filter procedures, and based on a minimum of not less than five samples taken over not more than a 30-day period.

In all waters except those used for primary contact recreation, the fecal coliform content shall not exceed a geometric mean of 1000/100 ml nor shall more than 10% of the samples during any 30-day period exceed 2000/100 ml; as determined by either multiple-tube fermentation or membrane filter techniques.

2. pH - The pH shall remain within the limits of 6.5 and 8.6 at all times. The maximum change permitted as a result of waste discharges shall not exceed 0.5 pH units.

3. Temperatures - Heat added to any water shall be the lowest practical value. In no case shall heat be added in excess of that amount that would raise the temperature of the minimum daily flow of record for that month more than 5° F above the monthly

providing and/or receiving heat wastes.

4. Turbidity - Turbidity of the water will be maintained at the lowest practicable values possible, but in no case shall:

a. Turbidity in the receiving waters due to the discharge of wastes exceed 50 Jackson units in warm water streams or 10 Jackson units in cold water streams.

b. Discharge to warm water lakes cause turbidities to exceed 25 Jackson units, and discharge to cold water or oligotrophic lakes cause turbidities to exceed 10 Jackson units.

A violation of the above numerical turbidity standards resulting from construction, mining, logging, and related land uses shall be grounds for abatement in accordance with ARS 36-1851 to 1969 inclusive.

5. Biocides - Biocide concentrations shall be kept below levels which are deleterious to human, animal, plant or aquatic life, or in amounts sufficient to interfere with this beneficial use of the water.

6. Radioactivity - The concentration of radioactivity in

b. Exceed the Public Health Service Drinking Water Standards for waters used for domestic supplies.

c. Result in the accumulation of radioactivity in edible plants or animals that present a hazard to consumers.

d. Be harmful to aquatic life.

Since any human exposure to ionizing radiation is undesirable, the concentration of radioactivity in natural waters will be maintained at the lowest practicable level.

C. Fish and Wildlife

1. Bacteriological Quality - In all waters except those used for primary contact recreation, the fecal coliform content shall not exceed a geometric mean of 1000/100 ml nor shall more than 10% of the samples during any 30-day period exceed 2000/100 ml; as determined by either multiple-tube fermentation or membrane filter techniques.

2. pH - The pH shall remain within the limits of 6.5 and 8.6 at all times. The maximum change permitted as a result of waste discharges shall not exceed 0.5 pH units.

3. Dissolved Oxygen - The discharge of wastes that

4. Temperature

a. Warm water fisheries - Heat added to any warm water fishery shall be the lowest practical value. In no case shall heat be added in excess of that amount that would raise the temperature of the minimum daily flow of record for that month more than 5° F above the monthly average of the maximum daily water temperature prevailing in the water or stream section under consideration; nor shall heat be added in excess of that amount that would raise the stream temperature above 93° F. This provision shall not apply to lakes or impoundments owned by a firm or individual for the express purpose of providing and/or receiving heat wastes.

b. Cold water fisheries - Heat added to cold water fisheries shall be the lowest practical value. In no case shall heated wastes be discharged in the vicinity of spawning areas. In other areas, winter temperatures (November through March) shall not be raised above 55° F and summer temperatures (April through October) shall not be raised above 70° F. In both winter and summer, heat shall not be added in excess of that amount that

purpose of providing cooling water and/or receiving heat wastes.

c. Wildlife - In any area where fisheries are not a consideration, the temperature of wastes discharged to any watercourse shall not interfere with any wildlife use, or esthetic values.

5. Turbidity - Turbidity of the water will be maintained at the lowest practicable values possible, but in no case shall:

a. Turbidity in the receiving waters due to the discharge of wastes exceed 50 Jackson units in warm water streams or or 10 Jackson units in cold water streams.

b. Discharge to warm water lakes cause turbidities to exceed 25 Jackson units, and discharge to cold water or oligotrophic lakes cause turbidities to exceed 10 Jackson units.

A violation of the above numerical turbidity standards resulting from construction, mining, logging, and related land uses shall be grounds for abatement in accordance with ARS 36-1851 to 1868 inclusive.

6. Biocides - Biocide concentrations shall be kept below levels which are deleterious to human, animal, plant or aquatic

continuous occupational exposure in National Bureau of Standards Handbook No. 69.

b. Exceed the Public Health Service Drinking Water Standards for waters used for domestic supplies.

c. Result in the accumulation of radioactivity in edible plants or animals that present a hazard to consumers.

d. Be harmful to aquatic life.

Since any human exposure to ionizing radiation is undesirable, the concentration of radioactivity in natural waters will be maintained at the lowest practicable level.

D. Agriculture

1. pH - The pH shall remain within the limits of 6.5 and 8.6 at all times. The maximum change permitted as a result of waste discharges shall not exceed 0.5 pH units.

2. Biocides - Biocide concentrations shall be kept below levels which are deleterious to human, animal, plant or aquatic life, or in amounts sufficient to interfere with this beneficial use of the water.

3. Radioactivity - The concentration of radioactivity in

b. Exceed the Public Health Service Drinking Water Standards for waters used for domestic supplies.

c. Result in the accumulation of radioactivity in edible plants or animals that present a hazard to consumers.

d. Be harmful to aquatic life.

Since any human exposure to ionizing radiation is undesirable, the concentration of radioactivity in natural waters will be maintained at the lowest practicable level.

Implementation Plan

The "action" plan of the standards is the plan of implementation and enforcement. Preservation and enhancement of water quality in Arizona is a primary function of the State Water Quality Control Council. The Council's implementation plan is a comprehensive program of surveillance, control of discharges to the rivers, enforcement and special activities relating to investigations, research coordination with other agencies concerned with water quality control, and support of a water augmentation program for the State.

This plan sets forth the requirements for treatment and/or control of all conventional municipal and industrial waste discharges in the State which affect interstate waters, specifies the time within which this is to be accomplished, and contains programs for dealing with other water pollution control problems. In general, the standards call for installation of secondary treatment or the equivalent, or higher, for all municipal and industrial wastes, by January 1, 1970. Information on the requirements for any particular discharger may be obtained from the Arizona State Department of Health.

Glossary of Terms

Advanced Waste Treatment - refers to methods and processes that will remove more contaminants from wastewater than are usually removed in present day conventional treatment plants. The processes may be physical-chemical or biological. Examples of advanced waste treatment are carbon columns, electrolytes, coagulates, reverse osmosis, electrodialysis, and ion exchange.

Bacteria-the best indicator of the sanitary quality of water has been an estimate of the density of coliform bacteria. There are two classifications:

1. Coliform or total coliform bacteria include a heterogeneous grouping of bacteria which are identified by bacteriological procedures to be gram-negative, non-spore-forming, rod shaped organisms which will ferment lactose with gas formation within 48 hours at 35° C. in either an aerobic or facultative anaerobic environment. Since these bacteria are eliminated in large numbers in fecal wastes, they have been a traditional bacteriological tool used to measure the occurrence and intensity of fecal contamination in stream pollution investigations.

2. Fecal coliform bacteria are that portion of coliform population which are capable of lactose fermentation at an elevated temperature of 44.5°C. Unlike some strains of non-fecal members of the total coliform group, fecal coliforms have a specific high order of positive correlation with warm blooded animal pollution, survive for shorter time in water and soil, and more closely correlate with survival patterns of enteric pathogenic bacteria.

Biochemical Oxygen Demand (B.O.D.)- the quantity of oxygen utilized in the biochemical oxidation of organic matter in a specified time and at a specified temperature. Waste discharges containing high levels of B.O.D. will deplete oxygen supplies in receiving

Dissolved Oxygen (D.O.)-the oxygen dissolved as a gas in sewage, water or other liquid usually expressed in milligrams per liter (mg/l) parts per million (ppm) or per cent saturation. Adequate dissolved oxygen levels are necessary in waters to protect fish and other aquatic life and to prevent offensive odors. Low dissolved oxygen concentrations are generally due to excessive organic solids discharged as a result of inadequately treated waste (having high B.O.D.); excessive algal growths may cause vastly fluctuating dissolved oxygen levels, and other factors such as temperature and water movement have an impact on dissolved oxygen levels.

Interstate Waters-Under the Federal Water Pollution Control Act, interstate waters are defined as:

1. rivers, lakes and other waters which flow across or form a part of State or international boundaries;

2. waters of the Great Lakes;

3. coastal waters--whose scope has been defined to include ocean water seaward to the territorial limits and waters along the coastline (including inland streams) that are influenced by the rise and fall of the tide.

Intrastate Waters-rivers, lakes, and other waters wholly within the state, which do not flow across nor form a part of the boundaries of the state.

pH-the index of hydrogen ion activity, used as an indication of acidity or alkalinity in water. The pH of most waters ranges from 6.5 to 8.5, and most uses of water, such as aquatic life propagation, prosper at these levels. In most cases, a pH outside this range is due to discharge of industrial wastes or decaying organic vegetation.

Pollution-the addition of sewage, industrial wastes or other harmful or objectionable material to water at a concentration or in sufficient

Primary Treatment - may be defined as that process or group of processes capable of removing a high percentage of floating and settleable solids. This is the first major treatment in a sewage treatment works, and generally removes from 30 to 65 per cent of the 5-day biochemical demand.

Secondary Treatment - may be defined as that process or group of processes capable of removing virtually all floating and settleable solids, generally from 80 to 95 per cent of the 5-day biochemical oxygen demand, and a similar level of removal of suspended solids in untreated waste. The equivalent treatment may generally be defined as that process or group of processes achieving maximum practicable removal of solids, oils, grease, acids, alkalis, toxic materials, bacteria, taste and odor causing materials, color and any other objectionable constituents contained in untreated waste to produce an effluent equivalent to that obtained from secondary treatment facilities in current use for any specific category of industrial waste.

Sewage - (1) the water supply of a community after it has been used and discharged into a sewer, (2) wastewater from the sanitary conveniences of dwellings, business buildings, factories and other institutions.

Sewage, Combined - a sewage containing both sanitary sewage and surface or storm water with or without industrial wastes.

Sewer, Combined - a sewer which carries both sanitary sewage and storm drainage. At times of heavy rainfall, the capacity of combined sewers may be exceeded and sewers will overflow. The overflow will bypass the sewage treatment plant and the combined wastewaters will be discharged directly into streams without treatment of any kind. This is a problem in many older cities in the United States, and there are various programs to deal with it.

Solids, Settleable - suspended solids which will subside in quiescent water, sewage or other liquid in a reasonable period.

of cooling waters from industrial processes, particularly power generation.

Toxic Materials - these may include hundreds of compounds present in waters due to industrial wastes, runoff from farm lands where pesticides have been applied and other causes which are harmful to human, plant, animal and aquatic life.

Warm and Cold-water Fish - warm water fish include black bass, sunfish, catfish, gar and other; cold-water fish include salmon and trout, whitefish, miller's thumb and blackfish. The temperture factor determining distribution is set by adaptation of the eggs to warm or cold water.

Biocide - A material applied to plants or soil as a growth regulator or pest control agent. These include, but are not limited to, insecticides and weedicides.

STATE AND FEDERAL AGENCY ADDRESSES

A. STATE

Division of Environmental Health
Arizona State Department of Health
Hayden Place West
4019 North 33rd Avenue
Phoenix, Arizona 85017

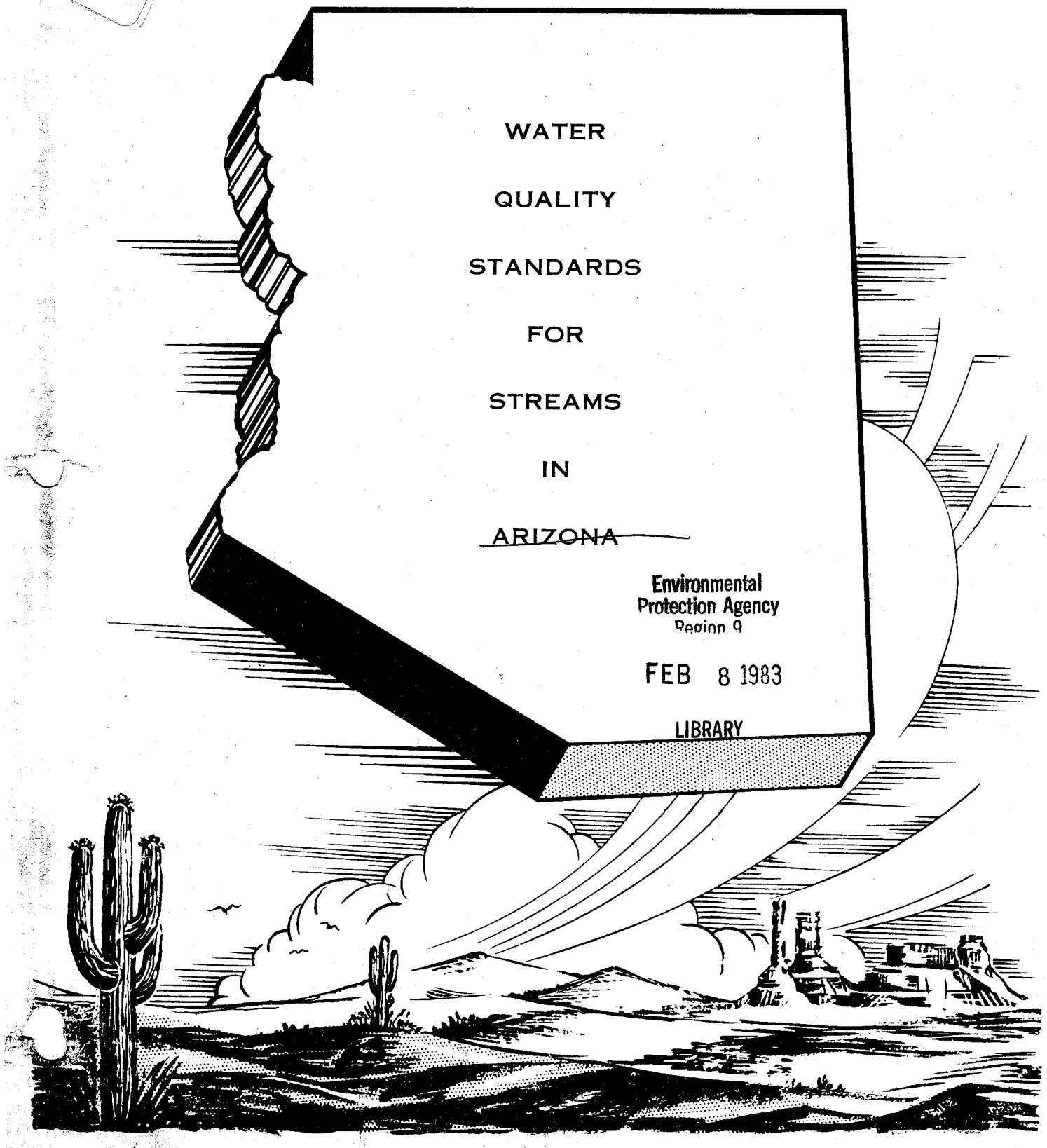
B. FEDERAL

Pacific Southwest Region
Feder Water Pollution Control Administration, USDI
760 Market Street
San Francisco, California 94102

Federal Water Pollution Control Administration
U. S. Department of the Interior
Washington, D. C. 20242

STATE DEPARTMENT of HEALTH

WATER QUALITY CONTROL COUNCIL



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WATER QUALITY CONTROL POLICY
for
GILA RIVER SYSTEM

1-0 WATERS CONTROLLED

1-1 This Water Quality Control Policy applies to the waters of the Gila River System in Arizona. The Gila River System drainage area is shown on Plate 1. A schematic of the system is shown on Plate 2.

1-2 Interstate Waters of the Gila River System: The following streams are interstate streams for purposes of the Water Quality Act of 1965:

a. Gila River - The Gila River enters Arizona from New Mexico, and remains an interstate stream until completely diverted for beneficial use at Ashurst-Hayden Dam. The portion of the river from this dam to its confluence with the Colorado River near Yuma is essentially a dry wash, and stream standards are meaningless.

b. San Francisco River - The San Francisco River starts in Arizona, flows through New Mexico and back into Arizona. It is an interstate stream throughout its course.

c. San Simon River - The San Simon River is technically an interstate stream because of minor intermittent flows from New Mexico.

d. San Pedro River - The headwaters of the San Pedro River are in Mexico, and the river is technically an interstate stream although the flow is very erratic with some completely dry periods. USGS Station 4705 flow data is shown in Exhibit 22.

e. Santa Cruz River - The headwaters of the Santa Cruz River are in Arizona, but the river flows through a portion of Mexico before re-entering Arizona on its way to join the Gila River, and is therefore an interstate stream. Flow, as seen in USGS Stations 4800, 4805, 4820 and 4890, Exhibit 22 is very erratic, and the river is dry throughout most of its course.

1-3 Intrastate Waters of the Gila River System: The following streams are intrastate streams for purposes of the Water Quality Act of 1965 since they do not contribute any sustained flow across any Arizona border:

a. Eagle Creek
b. San Carlos River
c. Mineral Creek
d. Queen Creek
e. Salt River
f. Verde River
g. New River
h. Agua Fria River
i. Hassayampa River
j. Centennial Wash
k. Miscellaneous creeks and washes which contribute minor amounts of intermittent flow to the Gila River or its major tributaries.

PLATE 1

GILA RIVER SYSTEM